



Recent Developments on iLUC Policies

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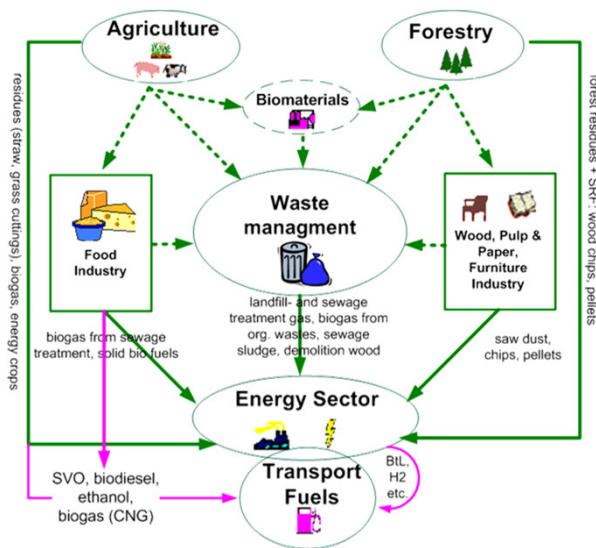
Scientific Director, IINAS

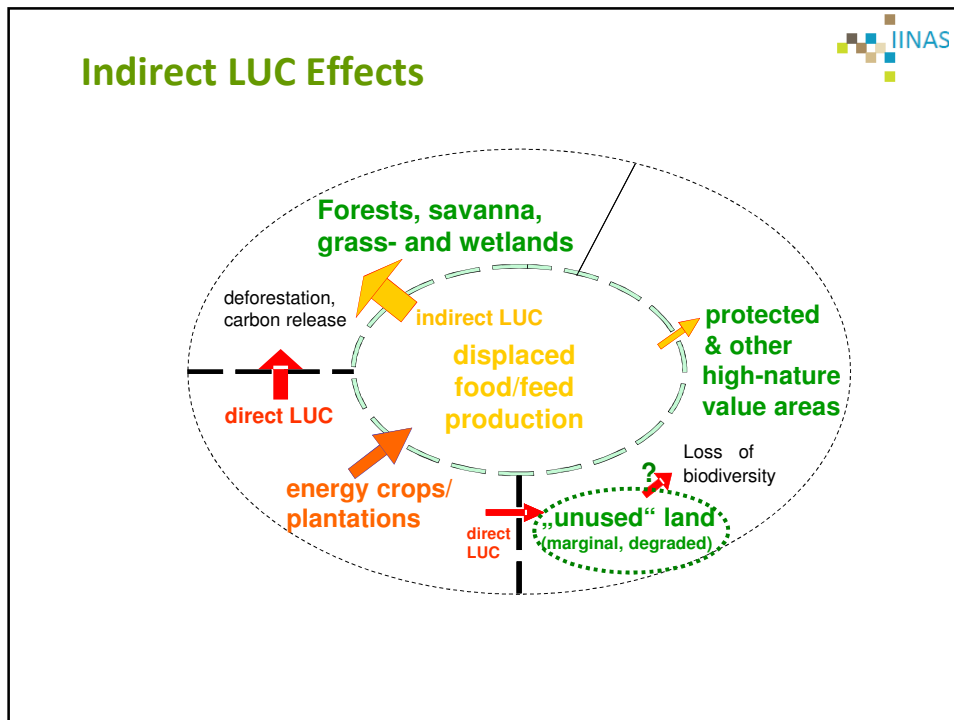
International Institute for Sustainability Analysis and Strategy

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“Socio-economic Impacts of Biofuels and Bio-products”
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Consider all Biomass Flows

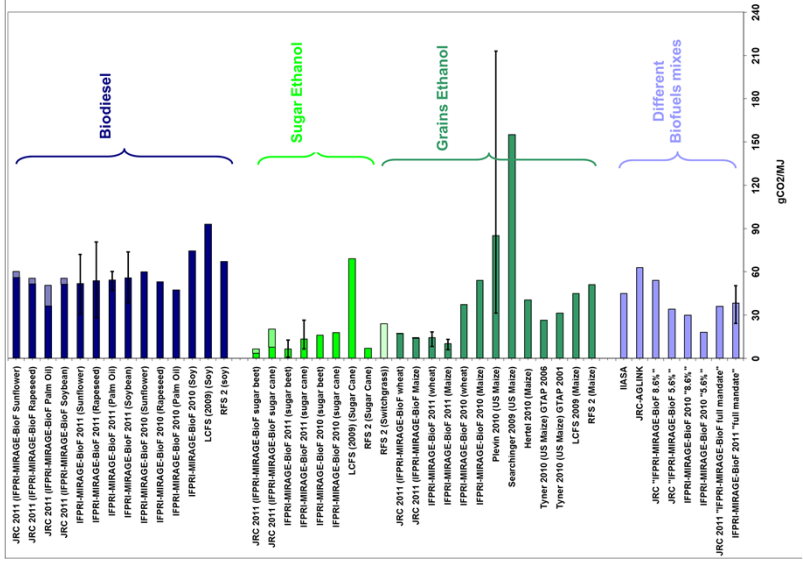




Indirect LUC

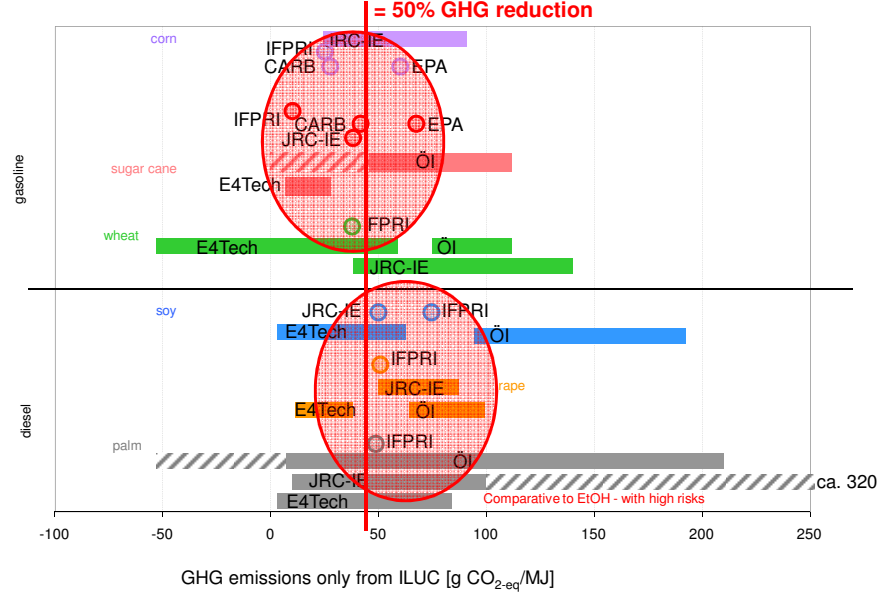
- All incremental use of fertile land imply indirect effects
- indirect LUC of bioenergy = direct LUC of agriculture/forestry
- real world only knows direct LUC
- **Distinguish between** analytical (science) vs. regulatory (policy)
- iLUC factor = proxy for **regulation** (EU, US...)

ILUC data from models...



Source: JRC compilation (2012)

EC and other relevant studies





Key Findings on iLUC and Policies

- Broad variation of ILUC emissions...but:
ILUC effects have significant impact on GHG balance of biofuels
- Current science allows **quantitative approximation** of GHG emissions from ILUC, differentiated for various biofuels → precautional approach + scientific updates!
- Already US regulations (RFS2, CARB) **include** quantitative ILUC values. EC proposal does not properly reflect US rulemaking on ILUC.
- Stricter policies on bioenergy land use support could achieve significant GHG savings – but at **higher cost**
- Need to consider **grandfathering**: 2008 cut-off year



iLUC: Dynamic View on Policies

- Future iLUC **can** become low:
 - **Dampening** ILUC through REDD (if adequately implemented and **financed**)
 - “free” land from **intensification** (**baseline**, tradeoffs!)
 - LUC policies in key countries (AR, BR, ID...)
- **Prioritizing** low-iLUC feedstocks:
 - wastes/residues (2nd generation), e.g. EC proposal
 - **unused + degraded** land (+ biodiversity/social safeguards)
- **iLUC is no “fate”**



Zero-ILUC Biomass Potentials

Land type	Area	energy	reference
degraded land	0.4-0.6 billion ha	8 - 110 EJ/a	Hoogwijk et al. (2003)
	2.50 billion ha (19% of land area)	~ 500 EJ/a	Metzger/Hüttmann (2009)
abandoned land	0.4 billion ha	27 EJ/a	Field et al. (2008)
marginal and degraded land	1.1 – 1.4 billion ha	150-200 EJ/a	Cai, Zhang, Wang (2011)
		90 EJ/a	Wicke (2011)
water-scarce, marginal + degraded lands		70 EJ/a	ECN et al. (2009)

Global primary energy demand in 2010 ca. 530 EJ

Data given for global data without ground truthing – country studies show:
correction factor needed, i.e. approx 20% conservative estimates realistic

→ **up tp 5% of global energy demand**



Other indirect effects

- impacts on biodiversity (e.g. destruction of habitats)
- intensification of agricultural production
 - additional GHG emissions
 - additional impacts on biodiversity
- **social** impacts (land rights, food prices, access to water)

→ price-induced iLUC also a **social (distributive) issue**

And: new discussion on indirect effects of **forest** bioenergy (displacement of non-energy uses)



Some Conclusions

- Models and simplified approaches give 10-100 g/MJ range for ILUC, depending on feedstock: **“entry level” for regulation**
- Consider cut-off date (2008) → approx. 5% share of 1G biofuels!
- Beyond models: **dampen iLUC + strengthen climate convention** to account for dLUC from **all sources and all sectors in all countries (+ cap!)**

More Information on ILUC...



The collage includes several documents:

- ECOPYS**: Summary of approaches to account for and monitor indirect impacts of biofuel production.
- IEA Bioenergy**: Bioenergy – The Impact of Indirect Land Use Change. Summary and Conclusions from the IEA Bioenergy E1C63 Workshop.
- Directorate-General for Internal Policy**: Policy Department Economic and Scientific Policy. Indirect Land Use Change and Biofuels.
- OEKO-Instytut**: Sustainability Standards for Internationally Traded Biofuels. The “iLUC Factor” as a Means to Hedge Risks of CHG Emissions from Indirect Land Use Change - Working Paper.

www.oeko.de/service/bio



More information

Sustainable Bioenergy: Key Criteria and Indicators

draft working paper of the

BIOMASS FUTURES

project funded by



see www.biomassfutures.eu

Criteria and Indicators for Sustainable Solid Bioenergy:

Workshop Series and Input Paper

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